

suggest that *gelidus* may be somewhat lighter than nominate *aequatorialis* (see below).

The nominate race is widely but discontinuously distributed from Ethiopia to Mozambique with an isolated population in northwestern Angola which is indistinguishable both in measurements and colour from birds from the eastern side of the continent. It is a remarkably uniform race and I have no hesitation in regarding as synonyms *A. a. alfredi* (Shelley) 1900: Mbara in Zambia, *A. a. schubotzi* Reichenow 1908: Ruwenzori Mountains, *A. a. reichenowi* Neumann 1908: Doinyo Erok in Kenya and *A. a. kittenbergeri* Madaraszy 1910: Ngare Dovash in Tanzania despite the fact that I have not seen the types, and topotypical material only of *alfredi*, *schubotzi* and *reichenowi*. The nominate race intergrades with *gelidus* in north eastern Rhodesia (Brooke 1967) but the other acceptable races are all isolates. Wing- and delta-lengths may be broken down respectively as follows:—adult ♂♂ 188–213 av. (45) 203.3, 3.5–9.0 av. (40) 6.56, adult ♀♀ 192–210 av. (26) 202.9, 3–8 av. (25) 5.84, juveniles both sexes 196–209 av. (9) 203.8, 3–6 av. (8) 4.44 mm. There is clearly no sex or age differentiation in wing-length. The sex difference in delta-length in adults is probably not real since the averages in juveniles broken down by sex, albeit based on very small samples, shows the opposite tendency: three ♂♂ average 4.16 and five ♀♀ average 4.60 mm. In no African swift have I found sexual dimorphism in delta-length. The overall mensural position may be stated as wing-length 188–213 av. (87) 203.1, adult delta-length 3–9 av. (70) 6.36, juvenile delta-length 3–6 av. (8) 4.44 mm.

A number of weights are available, mostly from Kenya with one each from Angola, Mozambique and Uganda: adult ♂♂ 84–104 av. (17) 92.32, adult ♀♀ 83–105 av. (9) 95.8, juvenile ♂♂ 86 and 88 g. As usual in swifts females average heavier than males. The overall range and average is 83–104 av. (28) 93.08 g.

The small number of juveniles collected of the nominate race may mean that the Mottled Swift lives longer than do other African swifts.

References:

- Alexander, B. 1898. Further notes on the ornithology of the Cape Verde Islands. *Ibis* 7(4): 277–285.
Bannerman, D. A. and Bannerman, W. M. 1968. *History of the birds of the Cape Verde Islands*. Edinburgh: Oliver & Boyd.
Brooke, R. K. 1967. *Apus aequatorialis* (von Mueller) (Aves) in Rhodesia and adjacent areas with description of a new race. *Arnoldia (Rhodesia)* 3 (7).
— 1969a. *Apus berliozi* Ripley, its races and siblings. *Bull. Brit. Orn. Cl.* 89: 11–16.
— 1969b. Age characters in swifts. *Bull. Brit. Orn. Cl.* 89: 78–81.
— 1970a. Geographical variation and distribution in *Apus barbatus*, *A. bradfieldi* and *A. niansae* (Aves: Apodidae). *Durban Mus. Novit.* VIII (19): 363–374.
— 1970b. Taxonomic and evolutionary notes on the subfamilies, tribes, genera and subgenera of the swifts (Aves: Apodidae). *Durban Mus. Novit.* IX(2): 13–24.
Lack, D. 1956. The species of *Apus*. *Ibis* 98: 34–62.
Vaurie, C. 1965. *The birds of the palaearctic fauna: Non-Passeriformes*. London: H. F. & G. Witherby.

Flamingo (Phoenicopteridae) remains from the British Upper Eocene

by C. J. O. Harrison

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Summary

The two Flamingo species known from the Upper Eocene of Britain have been assigned to other families. Two shafts of limb bones originally des-

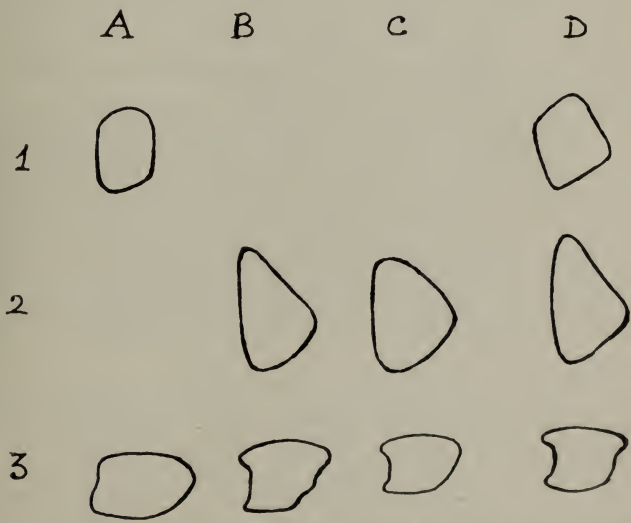
cribed as *Elornis* (?) show characters suggesting that they originate from a flamingo similar to recent species, which may be assigned to the Phoenicopteridae.

Introduction

One of the two flamingos described by Lydekker (1891) from the Upper Eocene of Britain, *Agnopterus hantoniensis*, has been placed in a separate family, the Agnopteridae (Howard 1955). The type humerus of the other, *Elornis anglicus*, is now considered referable to a species of a different suborder (Harrison & Walker, *in prep.*), leaving in the material ascribed to the true flamingos, Phoenicopteridae, at this period only two bone fragments assigned by Lydekker to *Elornis* (?) spp. Both are from Hordle (=Hordwell), Hampshire, and were said to be portions of right tibiotarsi. The first, presented by Sir Richard Owen in 1884 (B. M. reg. no. A 2) is from the proximal part of the shaft of a right tibiotarsus, showing part of one end of the fibular crest. The other, from the Hastings Collection, purchased in 1855 (B. M. reg. nos. 30289 = A 2670) is, in fact, a portion of the shaft of a tarsometatarsus, apparently from a similar bird.

Description

The first specimen is 95 mm long and about 9.0 × 6.2 mm at its thickest point, tapering a little before the fibular crest begins. The shallow proximal end of the tendinal groove is visible on the anterior surface, almost as far as the fibular crest. There is a conspicuous ridge almost along the centre of the posterior surface but a little nearer the internal side; the internal half of the surface curving away to join the more flattened anterior surface at a rather rounded edge, while the external half slopes away to join the anterior surface abruptly, producing a blade-like ridge along the external edge and giving the bone a characteristic transverse section (fig. 2, B). The second specimen is 58.6 mm long and 7.1 × 6.0 mm thick. It is sufficiently uniform to prevent



Transverse sections of limb bones. The anterior side is to the left, the external side is uppermost. 1, most distal part of tibiotarsus; 2, proximal part of tibiotarsus; 3, more distal part of tarsometatarsus.
A, *Palaeolodus gracilipes*. B, un-named specimens. C, *Phoeniconaias minor*. D, *Phoenicopterus ruber*.

definite determination of the side of the bird from which it came. The anterior metatarsal groove is deep and even and occupies most of the anterior width, leaving a small ridge on either side. The outer side of the bone is flattened, showing a conspicuous ridge along the posterior edge; while the inner surface is also flattened but slopes posteriorly, this sloping surface showing shallow paired grooves with a slight ridge between (fig. 3, B).

Discussion

Limb bones of this type, with an angular transverse section, are typical of the recent *Phoenicopteridae* and absent in other taxa. They are present in *Phoenicopterus* (fig. D) and to a slightly less marked extent in *Phoeniconaias* (Fig. C). In general the fragments suggest bones a little smaller and more slender than those of the Common Flamingo *Phoenicopterus ruber*, and a little larger than those of the Lesser Flamingo *Phoeniconaias minor*. In addition to comparison with these species it is necessary to consider them in relation to the other phoenicopterine genera of the tertiary period.

Elornis is a genus of flamingo-like birds of the Oligocene. The type species, *E. littoralis*, differs from *Phoenicopterus* in many details. The humerus is short and stout, and while the data on other limb bones are inadequate the various incomplete parts indicate similar thicker structures. This does not, therefore, seem a suitable taxonomic unit with which to link the present species.

Palaeolodus is another flamingo genus of the Tertiary, with species described from the Oligocene and Miocene. The material examined lacks proximal parts of tibiotarsi but distal parts of shafts are present. The two Eocene limb fragments under examination show similar ridges to those on recent *Phoenicopteridae* and on the latter the distal part of the tibiotarsus is almost square in transverse section (fig. 1, D). On *Palaeolodus* this is much more rounded with some anterior/posterior flattening (fig. 1, A). Similarly the tarsometatarsi of *Palaeolodus* species shows a less angular section with a more shallow central groove (fig. 3, A) and in neither case would there seem to be good reason to associate the fossil fragments with this genus. Howard (1955) recognises the *Palaeolodidae*, like the *Agnopteridae*, as a separate family within the larger phoenicopterine assemblage.

Agnopterus hantoniensis Lydekker, 1891 also occurs in the Upper Eocene of Hampshire. The type specimen is a right coracoid. Comparison with other osteological material confirms that it is a flamingo. It is one-third to one-quarter larger than the corresponding bones of the largest recent *Phoenicopterus* species, and considerable thicker and more massive. It is likely that the bird was larger than *P. ruber* and more heavily-built. Milne-Edwards's illustrations (1867-68) of the type distal end of the tibiotarsus of *A. laurillardii* shows a heavier bone with a more smoothly rounded shaft lacking the distinctive ridges. It therefore seems preferable not to link the two fragments with this genus.

The remaining genus recognised from the Tertiary is one comprising most of the recent species; *Phoenicopterus croiseti* having been described from the Lower Miocene. The tibiotarsal fragment under examination differs from similar bones of both *Phoenicopterus* and *Phoeniconaias* in that the fibular crest is proportionally much higher, and the line of the tendinal groove is indicated as far as the fibular crest, not slanting up markedly towards the distal commencement of the crest. The fragment of tarsometatarsus is cut away more abruptly on the posterior surface, where two shallow grooves are present, than are those of the above two genera.

Conclusions

These two fragments appear unrelated to the earlier named genera of flamingos or flamingo-like birds. They appear very similar to the two recent genera of flamingos but show differences sufficient to suggest that they should not be put into these genera. The degree of specialisation of the two shafts suggests that flamingos showing a degree of specialisation (at least insofar as limb bones are concerned) comparable with that of recent flamingos might have existed in the Upper Eocene period. In deference to requests from other palaeontologists that shafts of limb bones without ends should not be designated as types I have not named these specimens.

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References:

- Harrison, C. J. O. & Walker, C. A. *In prep.* Birds of the Middle and Upper Eocene of Britain.
Howard, H. 1955. A new wading bird from the Eocene of Patagonia. *Amer. Mus. Novit.* 1710.
Lydekker, R. 1891. *Catalogue of fossil birds in the British Museum (Natural History)*. London.
Milne-Edwards, A. 1867-68. *Oiseaux fossiles de la France*. Text, 1; Atlas, 1. Masson: Paris.

The occurrence of *Calidris alpina sakhalina* (Vieillot) in Britain

by James M. Harrison & Jeffery G. Harrison

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On 26th September 1970 an exceptionally large and long-billed juvenile Dunlin was recognised and collected on the Medway Estuary, Kent. In the hand it was seen to have not only a very long bill, but one that was unusually thick at the base; the bird was anatomically sexed as a female.

We have had considerable difficulties in building up completely full measurement data for the various races of the Dunlin. We find that Vaurie (1965), for instance, gives only the measurements of males, despite the great importance of sexual dimorphism in waders. Dement'ev *et al.* (1969) give only wing measurements for comparison, despite the importance of bill length in differentiation of Dunlin races. The race *C. a. sakhalina* breeds in North America and extreme eastern Asia, and intergrades with *C. a. alpina* as *C. a. centralis* Buturlin, a form recognised by Russian authorities (Dement'ev *et al.*, 1969: 145), breeding on Siberian tundras on the Rivers Yenisei and Colyma. *C. a. alpina* breeds in northern Scandinavia, Spitzbergen and northern U.S.S.R. as far as the Gyda peninsula. Vaurie, however, regards *centralis* as on a cline between the nominate race and *C. a. sakhalina*.

The form *sakhalina* is the largest of the Dunlin races, and the specimen from the Medway Estuary falls well within the measurements of this race as shown in the following table of measurements in mm of females based on specimens in the J. M. Harrison Collection and data from Hartert (1912-21) and Witherby *et al.* (1941):—